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ENVIRONMENTAL PROTECTION DIVISION

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NARRATIVE

TO: Manny Patel

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DATE: February 1, 2019

Facility Name:	**Oldcastle Precast, Inc.**
AIRS No.:	067-00271
Location:	Acworth, GA (Cobb County)
Application #:	26877
Date of Application:	December 10, 2018

Background Information

Oldcastle Precast, Inc. is an existing unpermitted liquid composite molding facility located at 3300 New McEver Rd. in Acworth, GA (Cobb County). The facility is located in the ozone maintenance area.

The facility consists of five molding processes for fabricating molded enclosures along with supporting equipment.

Styrenated resin and additives arrive in bulk or in drums, are stored on site and pumped into the batch plant. Similarly, aggregates, silica, and sand arrive in bulk, are stored on site and conveyed into the batch plant. Catalyst is stored in an on-site freezer and added in the batch plant.

The ingredients are mixed in the batch plant. The batch plant produces a mix of a fixed volume, and the mixed material is moved via an indoor crane lift to the back of one of five molding presses into a press mixer. The press molds are filled with an exact amount of mixed liquid product, and a fiberglass sheet molding compound (SMC) completely covers the mixed product. Once the molds are filled, they are closed and electric resistance heat is used for heating the molds, and it bakes at 300°F for 8 – 14 minutes. Then the mold opens, and the fabricated part is discharged. During the baking cycle, a new batch of material fills the spreader cells for the next set of molded parts. The process is considered to be most analogous to a Liquid Composite Molding (LCM) Process where the material is poured.

Purpose of Application

Oldcastle Precast, Inc. was an unpermitted facility. Application No. 26877 was submitted on December 10, 2018 and was received on December 11, 2018 to allow for the operation of liquid composite molding at the facility. A public Notice was issued for this application and expired _____.

Equipment List

Emission Units			Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Source Code**	**Description**
BAT	Material convey and mix	existing	CBAT	Camfil baghouse
M1	Molding press 1 – production, mold release & cleaning	existing	none	n/a
M2	Molding press 2 – production, mold release & cleaning	existing	none	n/a
M3	Molding press 3 – production, mold release & cleaning	existing	none	n/a
M4	Molding press 4 – production, mold release & cleaning	existing	none	n/a
M5	Molding press 5 – production, mold release & cleaning	existing	none	n/a
EG	Propane-fired emergency engine	existing	none	n/a

Storage Tanks

Source Code	Capacity (gallons)	Contents	Installation Date	True Vapor Pressure (psia)
RES1	6000	Resin tank	existing	n/a
RES2	6000	Resin tank	existing	n/a

Emissions Summary

Regulated emissions from the facility include particulate matter (PM, PM10, and PM2.5), VOC, and HAPs. HAPs emitted include the methyl methacrylate (MMA) and styrene monomers, and methanol. MMA, styrene, and methanol are also VOC. The facility's HAP emissions are well below the 10/25 tpy threshold. The Camfil baghouse is inherent to the process since the particulate matter generated consists of raw material required to make the product. Therefore, Camfil baghouse will be considered as the process equipment.

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions	Actual Emissions
$PM/PM_{10}/PM_{2.5}$	3.4	2.3
NOx	--	--
SO_2	--	--
CO	--	--
VOC	45.3	30.2
Max. Individual HAP	2.2	1.5
Total HAP	4.9	3.3

Pollutant	Potential Emissions	Actual Emissions
Total GHG (if applicable)	--	--

Regulatory Applicability

Georgia Rule 391-3-1-.02(2)(b) applies to all sources that are subject to at least one other emission limitation and are not subject to any other, more stringent, opacity standard. The rule limits visible emissions to 40 percent opacity.

Georgia Rule 391-3-1-.02(2)(e)1(ii) applies to all manufacturing processes with particulate matter emissions. Georgia Rule (e)(1)(ii) limits particulate emissions from existing equipment based on the following equation: $E = 4.1(P)^{0.67}$, where E equals the allowable particulate emission rate in pounds per hour and P equals the process input weight rate in tons per hour.

Georgia Rule 391-3-1-.02(2)(vv) applies to all volatile liquid handling and storage facilities subject to other VOC requirements contained in the rules. The facility's storage tanks are subject to the requirements of this rule because the facility is located in Cobb County and have capacities greater than 4,000 gallons. Georgia Rule (vv) limits the transfer of any volatile organic liquid other than gasoline from any delivery vessel (such as truck, railcars, etc.) into a stationary storage tank that is larger than 4,000 gallons to tanks equipped with submerged fill pipes. A submerged fill pipe is a fill pipe with a discharge opening which is within six inches of the bottom of the storage tank. VOC emissions from resin storage are covered by Georgia Rule (vv). In addition to the required submerged fill method, the resin tanks are enclosed in a climate-controlled building which maintains lower temperature during the summer and reduces temperature changes that cause tank "breathing" emissions.

Georgia Rule 391-3-1-.02(2)(ccc) applies to the operation of all mixing tanks. The facility's mixing tanks are subject to the requirements of this rule because the facility is located in Cobb County and potential VOC emissions from the facility exceed 25 tons per year. Georgia Rule (ccc) limits the operation of a mixing tank to multiple operational standards.

The facility's Emergency Generators are subject to 40 CFR 60 Subpart A New Source Performance Standards General Provisions and 40 CFR 60 Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. The operating hours have been limited to 200 hours per year to satisfy the emergency generator's definition, and not subject the facility to Georgia Rule (mmm).

Georgia Rule 391-3-1-.02(2)(tt) applies to the Oldcastle because the facility is located in Cobb County and potential VOC emissions from the facility exceed 25 tons per year. Oldcastle has performed a Reasonably Available Control Technology (RACT) analysis for VOC facility-wide emissions to identify potential VOC emission reduction and fulfill the requirement.

RACT Review for VOC

Three activities at Oldcastle associated with resin mixing and production, mold release, and cleaning operations have the potential to emit VOC.

1. Resin Mixing and Production – Compression Molding of Liquid Composite Molding (LCM) - Poured

VOC emissions from resin mixing consist of styrene and methyl methacrylate. Emissions from production consist of styrene, methyl methacrylate, and methanol. Emissions of styrene and methyl methacrylateare inherent to the resin and there are no alternatives for the use/presence of these compounds in the resin used. Methanol emissions are also inherent to the use of silane. There are no available alternatives for silane. VOC present in catalyst compounds are consumed in reaction and result in negligible emissions. Total current potential VOC emissions from mixing and production are estimated to be 4.8 tons per year.

2. Mold Release

A mold release product is sprayed into the molds before addition of resin. The mold release product contains VOC, but not HAPs. The mold release product (Axel Release 249-B41) contains 0.1925 lb VOC per lb of product. All VOC in the mold release product is assumed to be emitted. Total current potential VOC emissions from use of the mold release product are estimated to be 5.6 tons per year.

3. Mold Cleaning

Dibasic ester (DBE) is used to clean molds at the facility. The cleaning process is done by plant personnel using a hand-held mop to apply the DBE, which loosens cured material from the mold and assists with removal. All DBE used at the facility is assumed to be emitted, and this is the largest contributor to overall VOC emissions from the facility. Total current potential VOC emissions from the mold cleaning product are estimated to be 34.8 tons per year.

Identify Product Alternative

1. Resin Mixing and Production – Compression Molding of Liquid Composite Molding (LCM) - Poured

There are no alternative products available to replace the resin or silane used in production. The liquid composite molding process used at Acworth facility has no know viable alternatives that would lower VOC emissions.

2. Mold Release

The mold release product used at the Acworth facility is 19.25 percent VOC. No alternative products have been identified to replace the current mold release. However, the facility is employing engineering controls to minimize use of the mold release product.

3. Mold Cleaning

The facility has identified an alternative to the use of DBE for cleaning molds applicable under certain conditions. An alternative identified with the potential to reduce VOC emissions from mold cleaning is Polychem Acrastrip 600 CPR (Acrastrip). Acrastrip is approximately 60 percent VOC by weight in comparison to DBE, which is 100 percent VOC by weight. Additionally, Acrastrip is designed to reduce emissions by reducing the amount of the product used, in comparison to DBE. While DBE is used without dilution, Acrastrip can be diluted by approximately 50 percent with water and the same amount of the mixed product is used as 100 percent DBE [e.g., for every gallon of blended Acrastrip (~30% VOC) used, one gallon of DBE (100% VOC) would be required to complete the same amount of cleaning]. As a result of the dilution with water, VOC emissions from use of Acrastrip can be approximately 70 percent in comparison to DBE.

In initial testing of the Acrastrip alternative, the product was able to be used in cooler weather, but did not perform well in warmer weather. As a result, Oldcastle plans to use Acrastrip as an alternative to DBE approximately six months of the year, while DBE will continue to be used for the other six months of the year. The overall reduction in potential emissions anticipated as a result of alternative product use is anticipated to be approximately 12.2 tons per year (35 percent). Total potential emissions from mold cleaning using the Acrastrip alternative for four months per year are expected to reduce potential emissions from mold cleaning from 34.8 tons per year to 22.6 tons per year. The facility will continue to evaluate the use of other products to reduce VOC emissions and maintain a safe work environment for their employees.

Identify Technological Alternatives

With respect to quantifying the cost of capture and control of VOC emissions from resin mixing and production, mold release, and mold cleaning, the only way to capture these emissions would be to enclose the manufacturing facility. The manufacturing process requires the doors of the facility to be opened frequently to deliver materials into the facility on forklifts. The structure modifications necessary to create a total enclosure would be technically infeasible due to the size of the building, associated piping, conveyors, personnel movement, and the need for adequate airflow within the building as well to draw clean make-up air into the building.

As specified in the EPA-CICA Fact Sheet for Permanent Total Enclosures (EPA-452-F-03-033) the installation would be infeasible due to the need for additional considerations to ensure worker comfort and meet OSHA standards for the operators working inside of the enclosure. It is expected that heat would build up within the enclosure due to heat from the process, so worker exposure would be further complicated by any attempt to enclose the system. Therefore, the facility has eliminated the use of a total enclosure for this installation because it is technically infeasible for the proposed process.

The facility estimated the cost effectiveness of installing a Regenerative Thermal Oxidizer at the facility without a total control. The cost effectiveness of removing 35.4 tons of VOC per year is based on the potential VOC emissions rate from the manufacturing area. The estimated cost effectiveness is $11,878 per ton of VOC removed, and would be higher at actual emission rates from the manufacturing area (actual emission rates are lower and therefore the cost of removal would be higher on a per-ton basis). Also, the cost per ton VOC removed does not include various secondary engineering considerations that would be required to install this control equipment, such as substantial ducting, additional supports for roof installation. Based upon the estimated cost, it is believed that this control is cost prohibitive of installing this equipment.

1. Resin Mixing and Production – Compression Molding of Liquid Composite Molding (LCM) - Poured

Resin mixing and production is conducted in a building with overhead cranes for product movement. Installation of hoods or other similar mechanisms to capture VOC emissions resulting from production from the batch plant, mixer, and spreader cells are not reasonably possible given the size of the equipment, therefore add-on control devices to control emissions from production are not technologically reasonable for the Acworth facility.

2. Mold Release

Before Oldcastle used the 2100 Binks Conventional Air Spray Gun Pressure Feed. To use of best practice in the workplace, Oldcastle is employing the use of HVLP spray nozzles for the application of mold release product to reduce overspray; thereby lowering VOC emissions from use of mold release. As with emissions from resin mixing and production, mold release is sprayed on the molds in the production area. Installation of capture equipment for VOC emissions is not reasonably possible with the constraints of the equipment, therefore add-on control emissions from production are not technologically reasonable for the Acworth facility.

3. Mold Cleaning

As with emissions from resin mixing and production, mold cleaning is conducted in the production area. Installation of capture equipment for VOC emissions is not reasonably possible with the constraints of the equipment, therefore add-on control devices to control emissions from production are not technologically reasonable for the Acworth facility.

Use of Best Practice in the Workplace

EPA's control techniques guidelines for industrial cleaning solvents recommend work practices to assist in reducing VOC emissions from the use, handling, storage, and disposal of cleaning solvents and shop towels include. Application of the guidelines to the specific processes at Oldcastle include:

a. Use HVLP spray guns for application of mold release agent.

b. Facility shall only use Acrastrip or similar VOC content product in the mold cleaning operation from November 15 through March 15.

c. VOC content of mold release agent shall not exceed 20% by weight.

d. Covering containers of mold cleaning chemicals when not in use;

e. Minimizing overspray of chemicals containing VOC;

f. Storing and disposing of used solvent and shop towels;

g. Maintaining cleaning equipment;

h. Repairing solvent leaks.

i. Monitor air pressure for HVLP guns.

Oldcastle estimates that adhering to workplace practices at the facility will reduce VOC emissions from mold release and mold cleaning by approximately 5-10 percent. These activities are currently being employed at the facility in order to reduce VOC emissions.

The overall reduction in potential emissions from the use of best practices is expected to be 2 to 4 tons of VOC per year.

Eliminate Technically of Economically Infeasible Options

Capture of VOC emissions from facility operations at Oldcastle is not technically feasible, therefore, use of an add-on control system to reduce captured VOC emissions is also not technically feasible. Use of a RTO to control emissions without total enclosure is shown to be cost prohibitive.

Evaluate Most Effective Controls and Document Results

Through assessment and implementation of product alternatives, efficient application techniques for release agents, and use of best management practices, Oldcastle anticipates reducing the potential to emit VOC emissions by approximately 14 tons per year. Current facility potential VOC emissions are 45.3 tons per year. A potential reduction in VOC emissions of 14 tons per year is equivalent to a 30 percent reduction.

Oldcastle recommends defining RACT for the Acworth facility as use of product alternatives, efficient application techniques for release agents, and use of best management practices for VOC.

Permit Conditions

Condition 2.1 limits facility-wide VOC emissions to 45.3 tpy. The limit was based on facility's RACT Analysis.

Condition 2.2 subjects the facility to Georgia Rule (b).

Condition 2.3 subjects the facility to Georgia Rule (e).

Condition 2.4 subjects the facility to Georgia Rule (n).

Condition 2.5 subjects the facility to the applicable requirements of 391-3-1-.02(2)(tt) - RACT.

Condition 2.6 subjects the facility to Georgia Rule (vv), which applies to storage tanks greater than 4.000 gallons and requires the use of submerged fill pipes when the tanks are being filled with volatile organic liquids other than gasoline.

Condition 2.7 subjects the facility to Georgia Rule (ccc), which applies to the mixing tanks and requires various methods to control VOC emissions, such as tank covers, fill pipes, non-VOC cleaners, etc.

Condition 2.8 requires the facility operates the Camfil baghouse (CBAT) whenever the associated equipment is being operated.

Conditions 2.9 and 2.10 are applicable requirements for 40 CFR 60 Subpart JJJJ - "Standard of Performance for Stationary Spark Ignition Internal Combustion Engines,".

Condition 3.1 is a template condition that requires prevention fugitive emissions of air contaminants.

Condition 3.2 requires the facility to keep all cleaning materials in closed containers.

Condition 4.1 is the spare filter media supply requirement for the Camfil baghouse (CBAT).

Condition 5.1 is the general monitoring requirements.

Condition 5.2 is the weekly pressure drop monitoring requirement for the Camfil baghouse (CBAT).

Condition 5.3 requires a daily check of visible emissions (VE) from the Camfil baghouse (CBAT).

Condition 5.4 requires inspections to ensure compliance with the requirements of Georgia Rule 391-3-1-.02(2)(ccc) in Condition 2.9.

Condition 6.1 is a template condition.

Condition 7.1 requires the maintenance of monthly VOC usage records.

Condition 7.2 requires the use of monthly VOC usage records to calculate total monthly VOC emissions. A notification must be submitted if VOC emissions exceed 3.77 tons during any calendar month.

Condition 7.3 requires the use of the VOC emission data in Condition 7.2 to calculate the 12-month rolling total VOC emissions from the facility on a monthly basis. A notification must be submitted if VOC emissions exceed 45.3 tons during any consecutive 12-month period. This condition is required to demonstrate compliance with the emission limit in Condition 2.1.

Condition 7.4 is the recordkeeping requirement for emergency generators.

Toxic Impact Assessment

SCREEN3 dispersion model was used to assess the ambient impact of each of the toxic air pollutants being emitted from this facility. The results were provided by the facility. The facility emits mainly styrene, morpholine, aluminum oxide, methanol, propan-2-ol, and methyl methacrylate. The facility was considered as a volume source.

The SCREEN3's input and output print-out sheets as well as the spreadsheet summarizing the resulted AACs and MGLCs for all the toxic compounds in consideration are included by the facility in the application. The Division reviewed their TIA and found no inconsistencies. None of the MGLCs examined has exceeded its corresponding AAC as shown in Table below:

Compound	MGLC (1-hr) ($\mu g/m^3$)	MGLC (long-term) (µg/m3)	Long Term AAC (mg/m3)	Compliant Long Term
Styrene	2.60E+02	2.08E+01	1.00E+03	Yes
Morpholine	2.00E+02	8.01E+01	1.67E+02	Yes
Aluminum Oxide	1:00E+01	4.00E+00	3.57E+01	Yes
Titanium Oxide	1.00E+00	4.00E-01	3.57E+01	Yes
Methanol	9.01E+02	3.60E+02	6.19E+02	Yes
Propan-2-ol	2.03E+03	8.17E+02	2.33E+03	Yes
Methyl Methacrylate	8.21E+02	6.57E+01	7.00E+02	Yes

Summary & Recommendations

I recommend issuance of Permit No. 3272-067-0271-B-01-0 to Oldcastle Precast, Inc. which is located at 3300 New McEver Rd. in Acworth (Cobb County). This permit allows for the operation of a liquid composite molding facility. A public Notice was issued for this application and expired _____. The SSCP will be responsible for compliance and inspection of this facility.